

PATENT ABSTRACTS OF JAPAN

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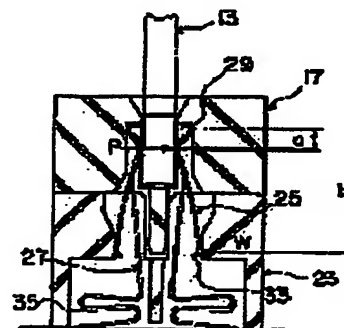
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(72)Inventor : HASHIGUCHI TORU

(54) EDGE CONNECTOR**(57)Abstract:**

PURPOSE: To provide an edge connector capable of eliminating the need of a large connecting and disconnecting force, and allowing the easy maintenance of proper impedance matching.

CONSTITUTION: This edge connector is movable along the prescribed direction relative to a housing 17 for contact therewith, and has a base insulator 23 with a taper aperture 21 tapered along the prescribed direction, so as to correspond to a carrier groove 15. Furthermore, the connector has an elastic sheet 25 and a flexible printed circuit material 27. The sheet 25 is bent like a U-shape, as to have a bent section 31 for slidable contact with the engaging section of a printed circuit board 13. Also, the material 27 has one fastening end fixed to the vicinity of the section 31 and the other fastening end fixed to the base insulator 23 via a bent section 35. In addition, the material 27 expands or contracts along the prescribed direction, when the housing 17 comes in contact with the base insulator 23 under a load due to the engaging section of the board 13.

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CLAIMS

[Claim(s)]

[Claim 1] In the edge connector equipped with housing with the acceptance slot for accepting the fitting section of the printed circuit board which put in order and implanted two or more pads for connection in the direction which was able to be defined beforehand Are relatively [housing / this] movable so that said housing may be contacted in said direction defined beforehand. The base insulator equipped with taper opening which became a taper along said direction defined beforehand corresponding to said acceptance slot, The elastic sheet metal formed in the character of **** so that it might have the contact slide other end slid in contact with the flection crooked so that it might slide to said acceptance slot in contact with the contact fixed end by which contact immobilization is carried out, and said fitting section, and said taper opening, It has further the flexible printed circuit member expanded and contracted in said direction defined beforehand between these fixing edges with the fixing end which fixes near the flection of this elastic sheet metal, and the fixing other end which fixes to said base insulator. The edge connector characterized by carrying out direct continuation of said printed circuit board and said flexible printed circuit member through said flection when said printed circuit board is accepted in said acceptance slot and said housing contacts said base insulator.

[Claim 2] The edge connector characterized by connecting said flexible printed circuit member with said fixing other end through the flection for making telescopic motion easy in an edge connector according to claim 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a connector and the edge connector which carries out direct continuation to a printed circuit board by the low insertion force especially.

[0002]

[Description of the Prior Art] The conventional edge connector is equipped with the housing 17 with the acceptance slot 15 for accepting the fitting section of the printed circuit board 13 which put in order and implanted two or more pads 11 for connection which describe drawing 4 later in the direction which was able to be defined beforehand with reference to drawing 8.

[0003] The fitting section slides on a printed circuit board 13 with the contact 19 implanted in the acceptance slot 15, extends it, and insertion and connection of it are done.

[0004]

[Problem(s) to be Solved by the Invention] However, in the conventional edge connector, the big insert-and-remove force is required, and, moreover, impedance matching is difficult.

[0005] Then, the big insert-and-remove force is unnecessary for the technical technical problem of this invention, and, moreover, is to obtain an edge connector with easy impedance matching.

[0006]

[Means for Solving the Problem] In the edge connector equipped with housing with the acceptance slot for accepting the fitting section of the printed circuit board which put in order and implanted two or more pads for connection in the direction which was able to be defined beforehand according to this invention Are relatively [housing / this] movable so that said housing may be contacted in said direction defined beforehand. The base insulator equipped with taper opening which became a taper along said direction defined beforehand corresponding to said acceptance slot, The elastic sheet metal formed in the character of **** so that it might have the contact slide other end slid in contact with the flecion crooked so that it might slide to said acceptance slot in contact with the contact fixed end by which contact immobilization is carried out, and said fitting section, and said taper opening, It has further the flexible printed circuit member expanded and contracted in said direction defined beforehand between these fixing edges with the fixing end which fixes near the flecion of this elastic sheet metal, and the fixing other end which fixes to said base insulator. When said printed circuit board is accepted in said acceptance slot and said housing contacts said base insulator, the edge connector characterized by carrying out direct continuation of said printed circuit board and said flexible printed circuit member through said flecion is obtained.

[0007]

[Function] A base insulator is relatively [housing / this] movable so that housing may be contacted in the direction defined beforehand, and it is equipped with taper opening which became a taper along the direction beforehand defined corresponding to the acceptance slot. While formed in the character of **** so that elastic sheet metal may have the contact slide other end slid in contact with the flecion crooked so that it might slide to an acceptance slot in contact with the contact fixed end and the fitting section by which contact immobilization is carried out, and taper opening, a flexible-printed-circuit member expands and contracts in the direction beforehand defined between these fixing edges with the fixing end which fixes near the flecion of elastic sheet metal, and the fixing other end which fixes to said base insulator. When fitting of the printed circuit board is carried out to

an acceptance slot and housing contacts a base insulator, direct continuation of a printed circuit board and the flexible printed circuit member is carried out through a flection. The flexible printed circuit member is connected with the base insulator through the flection, and when fitting of the printed circuit board is carried out to an acceptance slot and housing contacts a base insulator, it is expanded and contracted easily.

[0008]

[Example] The edge connector by one example of this invention is explained using a drawing.

[0009] If drawing 1 is referred to, the edge connector by one example of this invention is relatively [housing / this] movable so that housing 17 may be contacted in the direction defined beforehand, and is equipped with the base insulator 23 with the taper opening 21 which became a taper along the direction beforehand defined corresponding to the acceptance slot 15.

[0010] Edge KONEKUKUTA of this invention is further equipped with elastic sheet metal 25 and the flexible printed circuit member 27. Elastic sheet metal 25 is formed in the character of **** so that it may have the contact slide other end 33 slid in contact with the flection 31 crooked so that it might slide to the acceptance slot 15 in contact with the fitting section of the contact fixed end 29 and a printed circuit board 13 by which contact immobilization is carried out, and the taper opening 21. The flexible printed circuit member 27 has the fixing end which fixes near the flection 31 of elastic sheet metal 25, and the flection 35 for making telescopic motion easy is formed in the other end. The lower limit of this flection 35 is connected to another wiring side substrate (36 of drawing 7) at the connection section 37 for making soldering connection.

[0011] As shown in drawing 2 , drawing 6 , and drawing 7 , when a printed circuit board 13 (shown also in drawing 4) is stuffed into the acceptance slot 15, fitting is carried out and housing 17 contacts the base insulator 23, a printed circuit board 13 and the flexible printed circuit member 27 carry out direct continuation through a flection 31. When contacting, when the flexible printed circuit member 27 is very soft, by balance of the moment of the fixed end 29, the balance of contact force P which joins elastic sheet metal 25 serves as $Wxb=Pxa$, and serves as $W=Pxa/b$ ($a < b$) (dimension which showed a and b to drawing 2). Therefore, the force W of joining the base insulator 23 which is slippery and moves inside an edge connector in the middle of insert and remove can be managed with the very small force to contact force P ($P \gg W$), and the insert-and-remove force becomes small.

[0012] In addition, the flexible printed circuit member 27 can make a grand side a fixing end with elastic sheet metal 25, and can constitute a microstrip line. In this case, what is necessary is just to connect a grand side and several contacts in the Bahia hall by the flection 31 neighborhood.

[0013]

[Effect of the Invention] Are relatively [housing / this] movable so that housing may be contacted in the direction in which the base insulator was defined beforehand according to this invention. Since it has taper opening which became a taper along the direction beforehand defined corresponding to the acceptance slot A flexible printed circuit member expands and contracts in the direction defined beforehand, and when a printed circuit board is stuffed into an acceptance slot, fitting is carried out and housing contacts a base insulator, direct continuation of a printed circuit board and the flexible printed circuit member is carried out through a flection. Consequently, the big insert-and-remove force is unnecessary, and does so the effectiveness that impedance matching is easy.

[Translation done.]

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TECHNICAL FIELD

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PRIOR ART

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EFFECT OF THE INVENTION

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TECHNICAL PROBLEM

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MEANS

[Means for Solving the Problem] In the edge connector equipped with housing with the acceptance slot for accepting the fitting section of the printed circuit board which put in order and implanted two or more pads for connection in the direction which was able to be defined beforehand according to this invention Are relatively [housing / this] movable so that said housing may be contacted in said direction defined beforehand. The base insulator equipped with taper opening which became a taper along said direction defined beforehand corresponding to said acceptance slot, The elastic sheet metal formed in the character of **** so that it might have the contact slide other end slid in contact with the flection crooked so that it might slide to said acceptance slot in contact with the contact fixed end by which contact immobilization is carried out, and said fitting section, and said taper opening. It has further the flexible printed circuit member expanded and contracted in said direction defined beforehand between these fixing edges with the fixing end which fixes near the flection of this elastic sheet metal, and the fixing other end which fixes to said base insulator. When said printed circuit board is accepted in said acceptance slot and said housing contacts said base insulator, the edge connector characterized by carrying out direct continuation of said printed circuit board and said flexible printed circuit member through said flection is obtained.

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OPERATION

[Function] A base insulator is relatively [housing / this] movable so that housing may be contacted in the direction defined beforehand, and it is equipped with taper opening which became a taper along the direction beforehand defined corresponding to the acceptance slot. While formed in the character of **** so that elastic sheet metal may have the contact slide other end slid in contact with the flection crooked so that it might slide to an acceptance slot in contact with the contact fixed end and the fitting section by which contact immobilization is carried out, and taper opening, a flexible-printed-circuit member expands and contracts in the direction beforehand defined between these fixing edges with the fixing end which fixes near the flection of elastic sheet metal, and the fixing other end which fixes to said base insulator. When fitting of the printed circuit board is carried out to an acceptance slot and housing contacts a base insulator, direct continuation of a printed circuit board and the flexible printed circuit member is carried out through a flection. The flexible printed circuit member is connected with the base insulator through the flection, and when fitting of the printed circuit board is carried out to an acceptance slot and housing contacts a base insulator, it is expanded and contracted easily.

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EXAMPLE

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[0011] As shown in drawing 2, drawing 6, and drawing 7, when a printed circuit board 13 (shown also in drawing 4) is stuffed into the acceptance slot 15, fitting is carried out and housing 17 contacts the base insulator 23, a printed circuit board 13 and the flexible printed circuit member 27 carry out direct continuation through a flection 31. When contacting, when the flexible printed circuit member 27 is very soft, by balance of the moment of the fixed end 29, the balance of contact force P which joins elastic sheet metal 25 serves as $Wxb=Pxa$, and serves as $W=Pxa/b$ ($a < b$) (dimension which showed a and b to drawing 2). Therefore, the force W of joining the base insulator 23 which is slippery and moves inside an edge connector in the middle of insert and remove can be managed with the very small force to contact force P ($P \gg W$), and the insert-and-remove force becomes small.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the side elevation of a cross section showing the condition of inserting a printed circuit board 13 in the edge connector by one example of this invention.

[Drawing 2] It is the side elevation of a cross section showing the condition of having inserted the printed circuit board 13 in the edge connector of drawing 1.

[Drawing 3] It is the plan of the edge connector of drawing 1.

[Drawing 4] They are some top views of a printed circuit board 13.

[Drawing 5] a part of edge connector of drawing 1 -- it is the side elevation of a cross section.

[Drawing 6] Although the printed circuit board 13 of drawing 4 was inserted in the edge connector of drawing 5, it is the side elevation of an important section cross section.

[Drawing 7] It is the front view of the edge connector of drawing 6.

[Drawing 8] It is the sectional view of the conventional edge connector.

[Description of Notations]

- 11 Two or More Pads for Connection
- 13 Printed Circuit Board
- 15 Acceptance Slot
- 17 Housing
- 19 Contact
- 21 Taper Opening
- 23 Base Insulator
- 25 Elastic Sheet Metal
- 27 Flexible Printed Circuit Member
- 29 Contact Fixed End
- 31 Flection
- 33 Contact Slide Other End
- 35 Flection
- 36 Wiring Side Substrate
- 37 Connection Section

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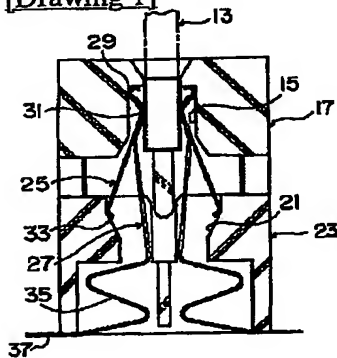
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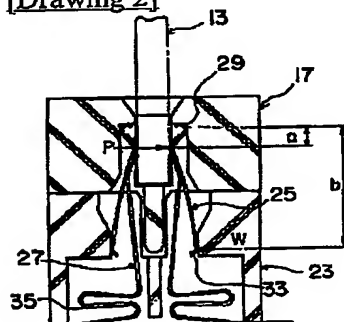
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DRAWINGS

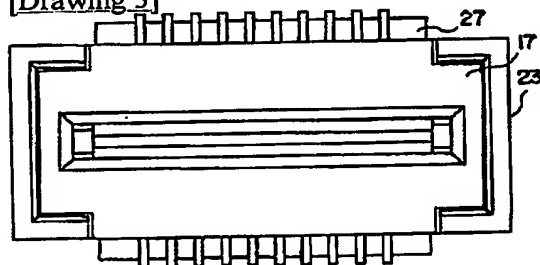
[Drawing 1]



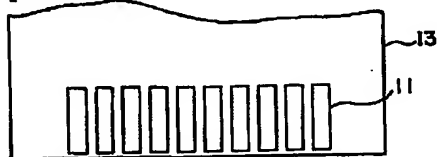
[Drawing 2]



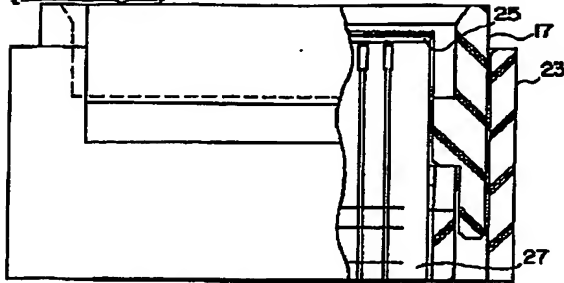
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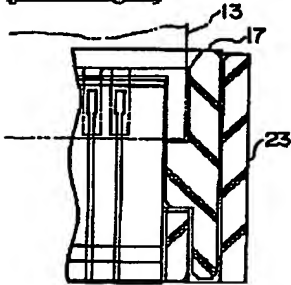
[Drawing 4]



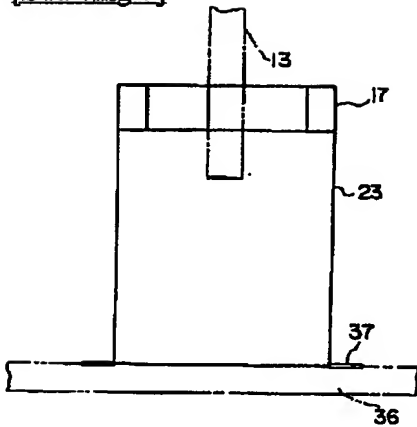
[Drawing 5]



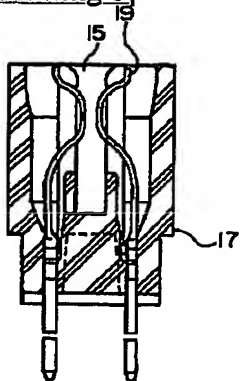
[Drawing 6]



[Drawing 7]



[Drawing 8]



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